

What is claimed is:

1. An optical information recording medium, comprising:
 - a substrate comprising a recording surface provided with a phase pit array for holding information;
 - a reflective layer formed on the recording surface;
 - and
 - a protective layer formed on the reflective layer,wherein each phase pit of the phase pit array is a cavity which is reentrant as viewed from the entrance side of a reading laser beam.
2. The optical information recording medium according to claim 1, wherein the thickness of the reflective layer is less in the inner face of the recess of each phase pit of the phase pit array than in other parts.
3. The optical information recording medium according to claim 2, wherein the reflective layer extends over the recording surface and has substantially the same thickness in the direction perpendicular to the principal plane of the substrate.
4. The optical information recording medium according to claim 1, wherein the thickness of the protective layer is 0.1 ± 0.03 mm.
5. The optical information recording medium according to claim 1, wherein the reading laser beam is a laser beam with a wavelength of 405 ± 5 nm that passes through an objective lens with a numerical aperture of 0.80 or more.
6. The optical information recording medium according to

claim 5, wherein the maximum value of the reflectance of the reflective layer with respect to the reading laser beam that is subjected to modulation according to the phase pit is in the range of at least 10% and no more than 25%.

7. The optical information recording medium according to claim 1, wherein the reflective layer comprises an alloy of which the principal component is Al that comprises at least one of Ti, Cr, Zn, Mn, Cu, Pd, Mg, and Si, and the thickness of the reflective layer is less than 14 nm in the direction perpendicular to the principal plane of the substrate.

8. The optical information recording medium according to claim 1, wherein the reflective layer comprises an alloy of which the principal component is Ag that comprises at least one of Pd, Ti, Cu, Si, and Sn, and the thickness of the reflective layer is less than 20 nm in the direction perpendicular to the principal plane of the substrate.

9. An optical information recording medium, comprising:

- a substrate comprising a recording surface provided with a phase pit array for holding information;

- a reflective layer formed on the recording surface;
- and

- a protective layer formed on the reflective layer,

this medium being played back by a reading beam that is a short wavelength laser beam emitted via an optical system with a high numerical aperture,

- wherein each phase pit of the phase pit array is a

cavity which is reentrant as viewed from the entrance side of the short wavelength laser beam.

10. The optical information recording medium according to claim 9, wherein the numerical aperture of the optical system is equal to or more than 0.80.

11. The optical information recording medium according to claim 9, wherein the short wavelength laser beam has a wavelength of 405 ± 5 nm.

12. The optical information recording medium according to claim 9, wherein the thickness of the reflective layer is less in the inner face of the recess of each phase pit of the phase pit array than in other parts.

13. The optical information recording medium according to claim 12, wherein the reflective layer has substantially the same thickness over the recording surface in the direction perpendicular to the principal plane of the substrate.

14. The optical information recording medium according to claim 9, wherein the thickness of the protective layer is 0.1 ± 0.03 mm.

15. The optical information recording medium according to claim 9, wherein the maximum value of the reflectance of the reflective layer with respect to the short wave laser beam that is subjected to modulation according to the phase pit is in the range of at least 10% and no more than 25%.

16. The optical information recording medium according to claim 9, wherein the reflective layer comprises an alloy of

which the principal component is Al that comprises at least one of Ti, Cr, Zn, Mn, Cu, Pd, Mg, and Si, and the thickness of the reflective layer is less than 14 nm in the direction perpendicular to the principal plane of the substrate.

17. The optical information recording medium according to claim 9, wherein the reflective layer comprises an alloy of which the principal component is Ag that comprises at least one of Pd, Ti, Cu, Si, and Sn, and the thickness of the reflective layer is less than 20 nm in the direction perpendicular to the principal plane of the substrate.